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Credit Card Data Management in Car Rental

Plan for a standard compliant system

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The purpose of this thesis was to find all instances that do not comply with the rules and regulations issued by the payment card industry within the credit card data management systems of a car rental company and to propose a plan for a fully compliant system. The company in question was a large car rental company in Finland. The company had an old system and processes with which it managed credit cards and credit card data which had not been upgraded in many years. This study proposed a plan for a new system which is fully compliant with these rules and regulations. Due to confidentiality issues the car rental company is only referred to as the Company in this thesis.

A comprehensive study of the current system and practices was conducted using a qualitative method of interviews of personnel handling credit cards or credit card data. The resulting current state analysis was then combined with best practice gathered from the payment card industry’s own standards, Merchant Rules of the Finnish credit card handler Nets and Finnish legislation. This combination resulted in the Initial Proposal which was then circulated for feedback. That feedback was used to generate the Final Proposal which is the outcome of this thesis.

The current state analysis revealed numerous non-compliance issues throughout the rental and invoicing process. These issues ranged from fully visible credit card number in the rental system and storing credit card information on printed out rental agreements through the manual keying in of the credit information to transferring the credit card data to invoicing unencrypted with the full credit card number visible.

The author recommends that the Company changes their credit card management systems and practices. The plan proposed in this thesis should be used as the basis for the new system.

Keywords	Car Rental, Credit Card, Payment Card

Contents

1 Introduction

1.1 Overview

The purpose of this thesis was to find all instances that do not-comply with the rules and regulations issued by the payment card industry within the credit card data management system of a car rental company and to propose a plan for a fully compliant system.

1.2 Case Company

The Case Company (later the Company) is one of the largest car rental companies in Finland. Some locations are also operated by sub-contractors. The Company employs approximately 135 people. Overall there are 70 locations in Finland. These locations can be divided to airport locations, city offices and replacement car locations.

1.3 Work at the Company locations

Most of the car rentals in Finland are replacement car rentals. To best serve these customers the Company has replacement car locations embedded into many different car dealerships. Downtown offices are also responsible for replacement car deliveries for their operational area. Customer Service Representatives make sure a vehicle matching the reservation is ready. This includes washing and cleaning the cars.

Only the largest locations have dedicated counter staff. Smaller location also handle deliveries in their area and the staff is present at location only on previously agreed times. These deliveries can be either to repair garages or to homes and offices. Many times the staff do not meet the customer at all.

The customer is not guaranteed a vehicle of certain make and model when making a reservation, except in certain special cases. Generally only a vehicle group is reserved and an example vehicle from within that group is communicated to the customer. Within the car group the vehicles match in size and properties.

The vehicles are not “owned” by the locations but instead the vehicles are available for certain area and all locations within that area use the cars according to their reservations. This makes it necessary to move the cars around between locations.

When the rental begins from the station customer presents his credit card at the time of pick-up and a deposit covering the rental amount is taken. Usually this deposit includes some extra in case of damages or missing fuel. Since most replacement cars are reserved via phone and are delivered to auto repair shops the day before rental starts, Company personnel never meet the customer. In these cases, the credit card number is taken over the phone and manually keyed in to take the deposit.

1.4 Thesis Outline

A general overview of the current practices will be gained by interviewing Company employees who work with credit card data along the rental process from the pick-up of the rental vehicle through invoicing to any possible reclamations. Information gained from these interviews will be used to conduct a current state analysis of the credit card data management.

The best practice of credit card management will be derived from the Merchant Rules: Special Rules for Car Rental Industry issued by Nets Oy in Finland and Payment Card Industry – Data Security Standard issued by PCI – Security Standards Council. This information will be used together with the results of a current state analysis to develop an initial proposal for the new credit card management practices.

The initial proposal will be circulated for feedback among the Company employees interviewed for this thesis. The initial proposal will be amended with their feedback to form the final proposal. This proposal is then submitted to Company management for consideration. Possible implementation of the proposal is outside the scope of this thesis.

The thesis is organized as follows: The first chapter briefly introduced the subject of thesis and offered a more detailed description of the Case Company and the nature of every day work in the Company. The second chapter will cover the business problem, objective and outcome. The third chapter covers the methods used in gathering the data used in the thesis. The fourth chapter contains the current state analysis. The fifth chapter contains the best practice of credit card data management. The sixth chapter contains the initial proposal. The seventh chapter contains the final proposal. The eight chapter contains discussion and conclusions.

2 Business Problem, Objective and Outcome

The standard method of payment for car rentals is credit card. It is estimated that three in every four rentals are paid with either personal or company credit card. (Accounting Supervisor 2016.)

The current credit card management system used by the Company is from 1996 and has not been updated unless absolutely necessary. As the system is old it does not fully comply either with Payment Card Industry – Data Security Standard (PCI-DSS) or the Merchant Rules of Nets Oy. Examples of non-compliance are not using point-of-sale terminals to read credit card information but instead keying the card number in manually or the full credit card number and expiration data being visible in the rental system. (Accounting Supervisor 2016.)

The non-compliance makes it easy for customers to dispute the credit card charges. They can cite for example the manual key in as a reason to dispute the charge even when they have agreed to provide the credit card number over the phone. This means that The Company risks losing revenue every time customer's credit card is not authenticated with point-of-sale terminal and a PIN. (Accounting Supervisor 2016.)

The objective of this thesis is to identify all instances of non-compliance and to create solutions for these instances. Some of them are caused by the system such as the full credit card number being visible and some instances are due to outdated equipment or wrong processes.

After all instances of non-compliance are identified, a plan for a new credit card data management system which addresses all of these instances will be created as the output of this thesis. The plan will include all the technical aspects such as point-of-sale terminals and also the necessary changes to all rental processes. The possible implementation of the plan is outside the scope of this thesis.

3 Methods and Material

This section introduces the methods that were used to gather data for the thesis project. It also discusses the research design of the thesis.

3.1 Research Design

3.1.1 Overview

The first stage of research was the Current State Analysis. In the second stage the best practice of credit card management was looked into. In the third stage an initial proposal for a new credit card management system was created. This initial proposal was then circulated for feedback. After feedback was taken into account the final proposal was created.

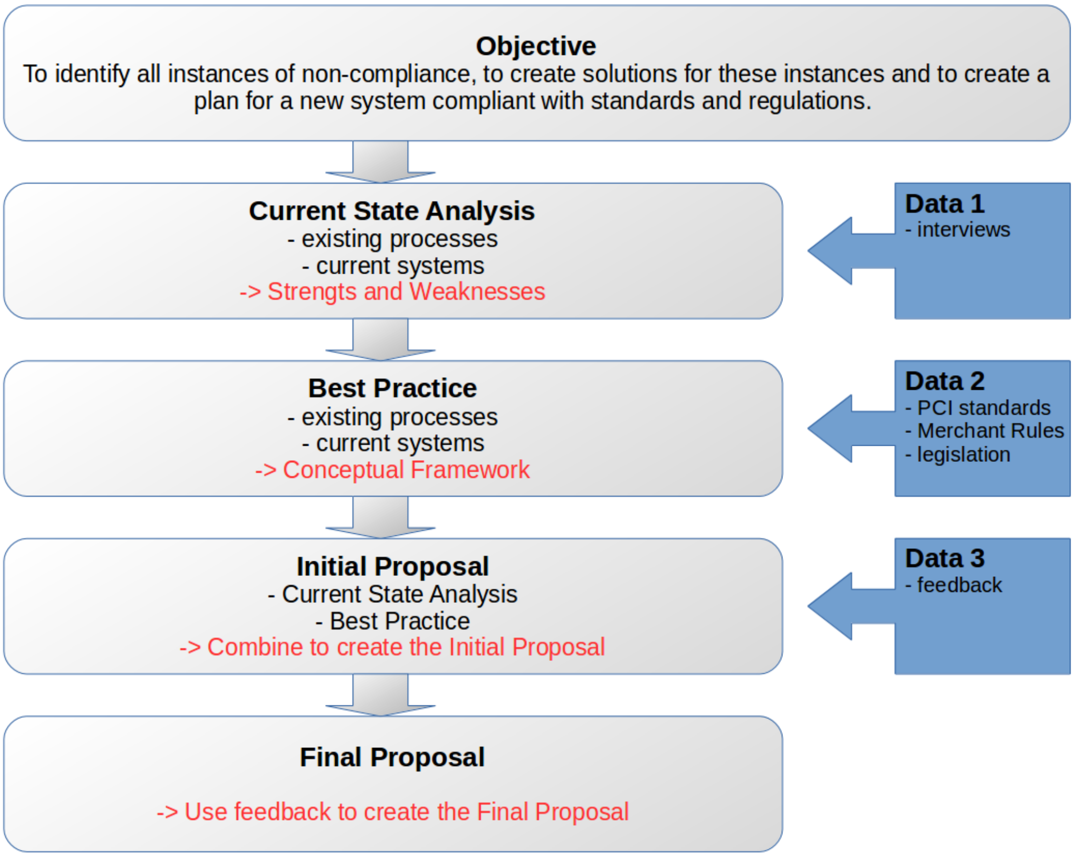

Figure 1: Research Plan

3.1.2 Current State Analysis

According to Gennoe (2016) a current state analysis is the starting point for change. A current state analysis should be conducted when there are issues already known, for example unprocessed orders or low level of customer satisfaction, when there is uncertainty within the workforce about which process to use or what to do in different situations and when organisation is planning to develop current processes but there is no documentation or the process is not understood well (Bridging the Gap 2016).

A current state analysis was conducted in order to find out the strengths and weaknesses of the current credit card management system and processes. This was done by interviewing personnel who are part of the current credit card management process and therefore have the necessary knowledge.

3.1.3 Best Practice

In order to address the weaknesses found in the current state analysis the best practice of credit card management was looked into. This included Payment Card Industry – Data Security Standard, Merchant Rules of Nets Oy and legislation.

PCI-DSS and the Merchant Rules govern the usage and handling of credit card data all the way from the point of sale to the final invoicing. Legislation is taken into account in the context of saving the personal information of customers.

3.1.4 Initial Proposal and circulation of Initial Proposal

Initial proposal was created by applying the best practice to the strengths and weaknesses found in the current state analysis. This proposal was then circulated for feedback among the personnel interviewed for the current state analysis. This was done in order to make sure that all the weaknesses had been addressed in the proposal and that the new credit card management system and processes would comply with PCI-DSS and the Merchant Rules.

3.1.5 Final Proposal

In the final proposal all the feedback from circulating the initial proposal was considered and the proposal modified accordingly. This final proposal listed all the actions needed in both processes and equipment to have a fully PCI-DSS and Merchant Rules - compliant system.

3.2 Research Approach

The study in this thesis was conducted as survey. A survey is defined by Ghauri & Grønhaug (2010, p. 108) as a method using interviews and questionnaires to collect data. According to Saunders et. al. (2009, p. 324) who quote Easterby-Smith et. al. and Jankowicz, with open-ended questions which may also be complex an interview is the best way to collect data.

A survey was chosen as the research approach because it was felt to be the best way of finding out all the instances in current processes, systems and equipment that were not compatible with PCI-DSS, Merchant Rules and legislation and subsequently led to customer complaints and possible revenue loss.

3.3 Data Collection and Analysis

The data used in this thesis to conduct the current state analysis was collected through interviews with the Company personnel who in the course of their work handle credit card information. Each one them handles this information at a different point of rental and invoicing process.

For the best practice credit card standards and rules laid out by the industry were looked into. This data was supplemented by pertaining pieces of Finnish legislation. After the Initial Proposal was circulated among the interviewed Company employees feedback was gathered by email.

Data Round	**Data Type**	**Data Source**	**Date & Approach**	**Recording**
Data 1 Current State Analysi	Interview	Accounting Supervisor Customer Care Manager Station Manager	7.8.2016 7.8.2016 8.8.2016 All face-to-face	30 minutes, Notes
Data 2 Best Practice	Credit card industry documentation Legislation	Nets Oy. Merchant Rules: Special Rules for Car Rental Industry PCI – Security Standards Council: Payment Card Industry Security Standards Personal Data Act		
Data 3 Feedback for Initial Proposal	Interview	Accounting Supervisor Customer Care Manager Station Manager	18.10.2016 Email	

Table 1: Data Collection and Analysis

Accounting Supervisor was chosen as an interviewee because they handle the invoicing process and knows how the credit card information is managed during the process. They also have the best knowledge of how the system currently used complies with standards and rules. Accounting department also processes new charges and credits resulting from corrections done in customer relations.

Customer Care Manager was chosen as an interviewee because they and their staff process most of the corrections done on the rental agreements. They therefore have the best knowledge of processes in use at customer care department. Customer Care Manager also has knowledge about incoming reservations and how credit card numbers appear there.

Station Manager was chosen as an interviewee because credit card is the standard payment method in rental car industry and the whole process starts when the customer picks up their rental vehicle. Additional consideration in choosing the Station Manager to be interviewed was that their location handles both rentals picked up in location and deliveries. This would provide the best picture of different situations where credit card data is managed by the rental staff.

All interviewees were asked the same set of questions. An example question is “Describe in detail how you handle credit cards/credit card information in your daily work”. The interviewees had been given the questions in advance so they had had time to prepare their answers. The interviews were completed in an informal setting where the interviewees answered the questions by narrating their roles and answers. Answers were documented by taking notes by computer. Only one follow up question, “Do you think this covers it all or can you think of something to add?”, was used.

3.4 Validity and Reliability

This sub-chapter will cover the general theory of validating research and making sure that the results are reliable. It will cover issues such as subject or participant error or the bias they may have. These issues are explained and the measures taken to counter them are also detailed.

3.4.1 Validity

Shenton (2004, p. 64) refers to Guba’s constructs and says that there are four criteria that can be used to test the validity of qualitative research. These criteria are credibility, transferability, dependability and confirmability.

According to Shenton (2004, p. 64) credibility means that the study really measured what was intended by the researchers. The credibility of this study was ensured by choosing the correct research method. The chosen method was a survey which was conducted as interviews of key personnel. Researcher’s long-term experience in the car rental industry was integrated in the study objectively. The whole thesis process was also supported by regular meetings and emails with the thesis supervisor.

Transferability or generalisability has been defined by Saunders, Lewis & Thornhill (2009, p. 158) as the possibility of the findings of the study being applicable in other settings such as different organisations. The purpose of the this study was to find out the current state of credit card management practices in a large Finnish car rental company and develop a proposal for new system which is compliant with all the rules and regulations imposed by the credit card industry. This means that the results are not generalisable. According to Saunders et. al. (2009, p. 158) this is no problem as long as generalisability is not claimed.

Dependability has been defined by Shenton (2004, p. 71) as follows: "...if the work were repeated, in the same context, with the same methods and with the same participants, similar results would be obtained...". This is ensured with the good documenting of the research methods, participants and results of the research.

Confirmability has been defined by Shenton (2004, p. 72) as the effort of making sure that all the findings of the study result from the information gained from informants and not from the researcher's own experiences and biases. To ensure this all sources are used with references with full details listed in the reference section.

3.4.2 Reliability

Saunders et. al. (2009, p. 156) have defined reliability as the extend to which consistent results are gained by data collection and analysis measures and procedures used in the study. Saunder (2009, pp. 156-157) go on to cite Robson's four threats to reliability which are subject or participant error, subject or participant bias, observer error and observer bias.

According to Mitchell & Jolley (2013, p. 155) participant or subject error is the possibility of them providing answers that are not what they truly feel about the issue. This is due to them being inconsistent and can be caused by misread questions, not concentrating or guessing. This can be controller by asking multiple questions about a single topic.

In this study the possibility of a participant error was dealt with by giving the interview questions to the participants in advance and in so doing allowing them to give well-thought out responses.

Participant or subject bias has been defined by Mitchell & Jolley (2013, p. 155) as the participant changing their behaviour. This can be done to give a favourable impression to or help the researcher or in some cases even hinder the researcher.

In this study the participants themselves were not measured or studied but their current methods of dealing with and handling credit cards and credit card data. They were briefed on the purpose of the interview beforehand.

According to an example by Saunders et. al. (2009, p. 157) observer error is having multiple research and thus having multiple ways to ask the questions. This can be dealt with by having a highly structured interviews.

In this study there was only one researcher. All the interviews followed the same procedure where the questions were provided to the interviewees in advance and were then gone through one by one in the actual interview.

Observer bias has been defined by Saunders et. al. (2009, p. 326) as the researcher using the study to push their own thoughts and beliefs. According to Saunders et. al. (2009, p. 297) observer bias cannot be totally eliminated but it can be controlled.

4 Current State Analysis

This section discusses briefly the theory of Current State Analysis. After that it will detail the current state of the credit card management across the whole rental process with strengths and weaknesses.

4.1 What is Current State Analysis

“A definition of the true state of the business, and an in-depth analysis of the root causes responsible for the company’s current situation.” (Iknow 2015).

According to Gennoe (2016) a current state analysis is the most critical undertaking for an organisation. When organisation knows its current situation it can identify risks, how much time it has to handle these risk and what measures to do so it has available. A current state analysis is the starting point for change

A current state analysis should be conducted when there are issues already known, for example unprocessed orders or low level of customer satisfaction, when there is uncertainty within the workforce about which process to use or what to do in different situations and when organisation is planning to develop current processes but there is no documentation or the process is not understood well. (Bridging the Gap 2016.)

According to Aotea Studios (2010) the purpose of doing a current state analysis is to get an understanding of company's state here and now. This included current business area and background, current functions and processes and involved stakeholders. A current state analysis shows the processes or functions or parts of them where change is needed.

When an "as is" process is analyzed information from those employees who actually perform the process is vital. Managers and experts who have knowledge and understanding of the process could also be helpful, even when they might not actually work in the process. (Bridging the Gap 2016.) According to Gennoe (2016) interviews and workshops with these people are the main starting point of a current state analysis. With these interviews and workshops the processes, documents and systems used in an organisation are found out. At this point staff suggestions and challenges are also collected.

These suggestions and challenges make it possible to deduce the risk and opportunities for the organisation (Gennoe 2016).

4.2 Current State Analysis of credit card management

This section will cover the operative side of credit card management in the first section. The second section will cover all the back-office processes involved.

4.2.1 Credit card management in rental transactions

Car rentals of the Company can be divided into two different groups which offer different challenges on credit card management. The first group is rentals that are picked up from the counter during the opening hours of the location. The second group is rentals that start outside the opening hours and deliveries where the Company employee never meets the customer. These are usually replacement car rentals that start from repair shops or car dealerships.

When the rental car is picked up during the opening hours standard procedure is to take a deposit from the credit card with the point-of-sale terminal by using chip-and-pin. If the chip-and-pin cannot be used for any reason then the customer can swipe the card and has to sign the deposit slip. Sometimes the staff key in the credit card number instead of customer swiping the card even though it is strictly prohibited. (Station Manager 2016.)

There are also cases where the payer is not present when the rental car is picked up. In these cases the credit card number has usually been provided by the same person who made the reservation by email. The customer picking up the rental vehicle might have a copy of the credit card with them but this is not usually the case. (Station Manager 2016.)

The software used to take the deposit is not integrated in the rental software. This necessitates the copying of credit card number from the deposit software to the rental system. It also means that sometimes the staff forgets to key in the deposit amount and approval code in the rental agreement. (Station Manager 2016.)

Copying the credit card information from the deposit software is not necessarily considered a violation of the rules as long as the information was gained by reading the credit card with the point-of-sale terminal. This makes the use of the terminal very important. (Accounting Supervisor 2016.)

For rentals starting outside the opening hours or deliveries the location contacts the customer beforehand and requests the credit card information either by phone or email. Once the credit card information is available it is manually keyed in to the system and a deposit is taken. If the customer is unwilling to provide the details asked they are offered a chance to go to any Company location and have the deposit taken using either chip-and-pin or swiping the card and signing the deposit slip. (Station Manager 2016.)

Sometimes in cases where the primary payer is the insurance company and the customer has good credit score, the location will allow the customer to write the credit card information on the rental agreement when picking up the rental vehicle. This information is then manually keyed in and the deposit taken. (Station Manager 2016.)

In long term rentals lasting between two months and one year, a new deposit is taken after each month. These deposits are almost always taken by using the credit card number and manually keying it in. This is done as not to inconvenience the client who would otherwise have to come to the Company location every month to have the deposit taken with chip-and-pin. (Station Manager 2016.)

Having the deposit taken by using chip-and-pin is the most secure way for both the customer and the Company. The customer knows the deposit amount and accepts it with his pin. The company is secure in that they have followed the rules and there is no chance of a wrong card being charged. (Accounting Supervisor 2016.)

Credit card deposits taken using information received via phone, email or from handwritten notes are not valid and the charges based on them could be disputed by the customer. There is no way for the Company to fight this dispute and it would have to either credit the charge or have the credit card company withhold the money in the next payment. This is also the situation when the credit card number is keyed in by the staff. (Accounting Supervisor 2016.)

In all the cases where the credit card information is received without actually seeing the card in question the Company runs a risk of using credit card not belonging to the renter. (Accounting Supervisor 2016.)

The credit card information is fully visible on the Company's copy of the deposit slip. This slip is stored with the rental agreement in drawers where all employees in the location have access to them. The full credit card number is also always shown in the rental system. In the rental system all company employees, including those who do not work directly with rental agreements, can see customer details such as name, driver's licence number and credit card information. (Accounting Supervisor 2016.)

The credit card number should always be shown masked and no one should be able to have access to see it in full form. This is especially true when the number is combined with other customer information such as social security number. (Accounting Supervisor 2016.)

4.2.2 Credit card management in back-office routines

The back-office routines involving credit cards are invoicing, invoice correction, charging of damages and other miscellaneous charges such as service charge for providing municipal authorities or Finnish police with customer information for parking fines or traffic tickets. The handling of incoming reservations is also included in this section.

4.2.2.1 Invoicing

The invoicing system used by the Company creates a file of all credit cards that were on rental agreements finalized for invoicing the previous day. This file has the credit card number in full form visible. This file is available only for personnel involved in invoicing. (Accounting Supervisor 2016.)

The file is fetched every morning from the server via secure FTP -transfer. Then the file is sent by an unsecured and unencrypted FTP -transfer to the company which processes all credit card charges. After the file is transferred a report detailing successful and failed charges is received. This file is also unencrypted and shows the credit card information in full visible form. This report is then modified to separate failed charges so that they can be keyed in manually. After this is done the report is printed and filed with all information visible and the original report saved on a network drive. (Accounting Supervisor 2016.)

The invoicing process is full of risks. As the files are transferred on unsecured connections and the full credit card number is always visible it possible for the numbers to end up in wrong hands. This same risk exists with the report that is stored on the network drive or printed out and filed. As the report is on a network drive shared by all employees in the Company headquarters it is available for everyone. The same is true for the printed version as the files are kept in unlocked filing cabinets. (Accounting Supervisor 2016.)

4.2.2.2 Invoice corrections

Invoice corrections are handled by the customer relations department. In most cases the correction results in the original charge being credited and a new charge being made. (Customer Care Manager 2016.)

Credit is processed by taking the credit card number from the rental system and keying it in manually to the deposit software. Accounting department is informed of the credit that needs processing by changing the owner of the customer complaint to a general finance employee and adding a new message on the case with the full credit card number and expiry date in order to make the applying of credit as quick as possible. (Customer Care Manager 2016.)

For new charges a deposit is taken by manually keying in the credit card number. Once the correction is finalized and approved the charge will happen in the same way as the original charge on the rental agreement. (Customer Care Manager 2016.)

Some of the new credit card charges processed in the customer relations department are not corrections but after rental charges. These charges are for example charges for damages, cleaning, service charge for handling parking tickets, postage etc. They are processed in the same way as new charges resulting from invoice corrections. (Customer Care Manager 2016.)

The customer is informed of either the correction or after rental charges after they have been processed. This informing happens by email. (Customer Care Manager 2016.)

As deposits for new charges are taken by keying in the credit card information manually they are not valid. The customer should also be informed of new charges before they are processed. As such the customer has good grounds to dispute the charges. (Accounting Assistant 2016.)

4.2.2.3 Incoming reservations

The Company has two main reservations channels. They are online reservation site and booking centre situated in the main office. Other channels include reserving the car directly from the pick-up location and third party brokers.

When the reservation is made on the Company's online site or by the booking centre the customer can give his credit card information which is then stored on the reservation. Once the reservation reaches the rental system customer's credit card information is shown in full form. (Customer Care Manager 2016.)

When the customer comes to pick-up their reserved car they should provide the same credit card and have the deposit taken by chip-and-pin. In practice it happens that the deposit is taken by just keying in the credit card number manually. As deposits taken this way are not valid the credit card information should always be masked. (Accounting Supervisor 2016.)

4.3 Summary of Current State Analysis

The credit card data management practices of the Company have serious issues. These issues can be found both in the operations level and in the back-office routines.

The most serious issues in the operations are taking the credit card details by the phone and manually keying the number in to take a deposit and showing the full credit card number in the rental system.

The back-office routines also have serious issues. The invoicing process should not use fully visible credit card numbers and the files should be encrypted. Invoice corrections and after rental charges should be communicated to the customer before they happen and not after as is the current practice.

Rental locations and back-office both also store material with the full credit card information visible. This material is available for all the location staff and in the back-office for everyone as well.

5 Conceptual Framework

5.1 Best Practice of credit card management

This chapter will cover the demands set on credit card management by Payment Card Industry – Data Security Standard (later PCI-DSS or PCI) and the Merchant Rules of Nets Oy that cover credit card transactions in Finland. The Merchant Rules also include additional rules set up for car rental industry and hotels. These rules are also covered in this section.

This chapter will also include a brief look into legislation. This is in the context of showing and storing personal information of customers.

5.1.1 Merchant Rules of Nets Oy

Merchant Rules cover all the credit card transactions in Finland. These rules were previously maintained by Luottokunta but since Nets Oy acquired Luottokunta Nets has been the authority. Nets Oy has also released additional rules for hotels and car rental industry due to different requirements of these two fields.

5.1.1.1 Reserving the rental car

Car rental company has the right to take customer's credit card information during the reservation as a guarantee that the customer will pick-up the reserved car. If the rental company so desires, it can also offer advance payment as a possibility. (Nets Oy 2012, p. 2.)

No charges or deposits can be made on the card if it is used only as a guarantee. The reserved vehicle must be available to the customer for 24 hours starting from the agreed pick-up time. In case the customer does not pick-up the car and has not cancelled the reservation in the agreed manner the rental company has the right to charge a No Show -fee on Visa or Visa Electron cards. (Nets Oy 2012, p. 2.)

Before the credit card can be used in advance payment the customer needs to be informed of the amount of advance payment, what is and what is not included in the payment and change and cancellation terms. The advance payment needs to be included in the final rental cost calculation. (Nets Oy 2012, p. 2.)

A reservation confirmation has to be sent to the customer whether the credit card was used only as a guarantee or an advance payment was made. This reservation confirmation needs to have the following details: name of the card owner, six first and four last digits and valid through date of the credit card, reservation confirmation number to be retained by the customer for possible later contact with the rental company, name and address of the pick-up location and opening hours of the pick-up and return locations. (Nets Oy 2012, p. 2.)

5.1.1.2 Pick-up and return of rental car

When the customer picks up the reserved vehicle a deposit is taken on their credit card. This deposit is taken to ensure that the credit card has enough limit left and that the card is still valid. The amount taken as a deposit is based on the length of rental, daily price of rental including taxes and possible mileage charges. The deposit cannot include any other costs, such as customer’s self risk or damages. (Nets Oy 2012, p.2.)

The deposit has to be always taken with a payment terminal. The customer will then accept the deposit either with chip-and-pin or their signature. The customer needs to be informed that with either the chip-and-pin or signature the rental company ensures that the correct credit card holder is picking up the reserved vehicle and that no charges are made and only a deposit is taken at this point. (Nets Oy 2012, p. 2.)

When the customer returns the car the condition of the vehicle, amount of fuel left and return date and time have to be confirmed in writing. The rental company also needs to confirm if there were no new damages or if no additional charges will be made. If the return is to a manned location this confirmation should be given immediately on return and in if the location is unmanned within five days of return. (Nets Oy 2012, p. 3.)

After the vehicle has been returned the final charge for the rental will be calculated and charged from customer’s credit card. In case the final amount is over 15% larger than the deposit, a new deposit needs to be taken. The final charge cannot include any costs relating to damages as these charges need to be made as a separate transaction. (Nets Oy 2012, p. 3.)

5.1.1.3 After rental charges and charges for damages

After the rental has finished it is possible to make charge for the following if they have been omitted from the final invoice on customer’s credit card: fuel, rental costs, vehicle delivery or pick-up, parking fines and speeding tickets accrued during the rental and customer’s self risk or damages. (Nets Oy 2012, p. 3.)

To ensure the validity of the after rental charges the rental company has to have the written agreement of the customer for the charges. This agreement can be part of a rental agreement but it needs to be its own segment on the agreement detailing the possible charges and the credit card used. The customer also has to indicate their agreement with a separate signature. (Nets Oy 2012, p. 3.)

Other qualifications of validity for after rental charges are that the deposit was taken, the charge was made within 90 days of the actual car rental charge and that the customer was informed of the amount charged, time and place and the reason of the charge in writing. (Nets Oy 2012, p. 3.)

In the event of a dispute the rental company has to show that it has fulfilled all the qualifications. All official documentation has to be presented in case of parking fines and speeding tickets. (Nets Oy 2012, p. 3.)
Interior cleaning charges cannot be made as after rental charges. These charges have to be made by using the payment terminal and the customer has to approve the charge with either their chip-and-pin or signature. (Nets Oy 2012, p. 3.)

In the event of the rental car being damaged during rental the rental company has the right to charge either the repairing costs or the amount of customer’s self risk on customer’s credit card. For the charge to be valid, in addition to all the other qualifications for after rental charges, the customer also needs to be given a written confirmation of repair costs within 10 days of return. The company must also give the customer 20 days to reply before making the charge. (Nets Oy 2012, p. 3.)

If the customer disputes the charge the rental company must provide the credit card company with the following: a copy of the rental agreement with customer’s signature showing that they have agreed that the damages accrued during the rental can be charged on their credit card, calculation of repairs costs made by authorized repair garage, a copy of accident report made by police (if available) and a copy of rental company's insurance terms. (Nets Oy 2012, p. 4.)

5.1.1.4 Cancelling the car rental

The customer has the right to cancel his reservation up to 72 hours before the start of rental. If the reservation is made so that the pick-up is in less than 72 hours then the customer has the right to cancel before 6pm on the day of pick-up. (Nets Oy 2012, p. 4.)

If the customer has followed cancellation terms they have to be given a cancellation number. The rental company has to confirm the cancellation within five days in writing. (Nets Oy 2012, p. 4.)

If the customer has not followed cancellation terms then the rental company can either charge a No Show -fee on Visa or Visa Electron cards or keep the advance deposit or some part of it. The No Show -fee is equal to a one day's rental charge. This charge always has to be made with a deposit. In case of a dispute the rental company has to be able to show that the customer did not cancel in accordance to the cancellation terms. It also has to be able to show that the customer has agreed to the cancellation terms and to the possibility of a No Show -fee. (Nets Oy 2012, p. 4.)

5.1.1.5 Fraudulent use of credit card

The rental company is responsible in case of a fraudulent use when the credit card and its holder have not been present when the deposit or charge was made. It is also responsible when the deposit or charge was made without identifying the card holder through either chip-and-pin or signature. (Nets Oy 2012, p. 4.)

A deposit is taken to ensure that the card exists and that there is enough limit left for the charge on the card. The deposit cannot be used to identify the card holder or to make sure that the person using the card is the correct credit card holder. (Nets Oy 2012, p. 4.)

5.2 Payment Card Industry – Data Security Standard

Payment Card Industry – Data Security Standard (later PCI-DSS) is a standard governed by Payment Card Industry – Security Standards Council that sets the rules such as technical and operational requirements for credit card transactions. The council was established by American Express, MasterCard Worldwide, Discover Financial Services, Visa Inc. and JCB International.

All the service providers who either store, process or transfer credit card holder information must comply with the PCI-DSS. PCI-DSS applies to all technical and operations components that have anything to do with cardholder information. (PCI – Security Standards Council 2010b.)

The PCI-DSS is divided into six goals. The goals are: building and maintaining a secure network, protecting credit card holder's information, having a program to manage any vulnerabilities in the system, having strong measures to control access, having regular testing and monitoring on the system and having a policy regarding security of information. (PCI – Security Standards Council 2010b.)

Goal	Regulation set by PCI-DSS
Building and maintaining a secure network	installing and maintaining a firewall to protect information
	default parameters such as password cannot be used
Protecting credit card holder's information	stored information must be protected
	all information transfer must be encrypted
Having a program to manage system vulnerabilities	must use regularly updated anti-virus software
	applications and systems used must be secure
Strong measures to control access	access to data must be restricted
	everyone with access must have unique ID
	physical access to data must be restricted
Regular testing and monitoring	tracking of data access
	schedule regular tests for system security
Policy of information security	All personnel must be aware of information security requirements

Table 2: Goals of PCI-DSS (PCI – Security Standards Council 2010b.)

All the credit card companies have their own PCI-DSS compliance program. The compliance of a service provider is checked with a three way compliance program. Steps in the program are: assessment, reports and monitoring. In the assessing phase the storage, processing and transferring of credit card information are tested. In the reporting phase the results of the assessing phase and proof of compliance are reported. In the monitoring phase access to and use of credit card information should be actively monitored. (PCI – Security Standards Council 2010b.)

5.1.2.1 Security of stored credit card information

Credit card information is all the information that is contained on a credit card. The data can be printed on the card or contained in the magnetic stripe or chip. The information includes primary account number (PAN), name of cardholder and the expiration date of the card. On the magnetic stripe and chip is stored in addition to these information needed to authenticate the card and authorize payments and deposits. (PCI – Security Standards Council 2010a.)

Unless necessary for a legitimate business need, credit card information should not be stored. Even when information is stored, only some of the data contained on the credit card can be stored. This information includes the personal account number, date of expiry and name of the cardholder. Measures must be taken to secure the stored data. (PCI – Security Standards Council 2010a.)

The measures to secure the stored data include always printing and showing the PAN partially masked, not storing the data in unsecured devices such as mobile phones or laptops and having the data stored in a secure, locked location. Only authorized personnel should have access to the data. (PCI – Security Standards Council 2010a.)

The information that can never be stored is the authentication and authorization data included either in the magnetic stripe or chip, card-validation code used in validating those transactions where the card is not present and personal identification number (PIN). This information cannot be stored even encrypted. (PCI – Security Standards Council 2010a).

The personal account number can never be shown in full. It has to be always masked. Only the first six and last four digits of the PAN can be shown. (PCI – Security Standards Council 2010a.)

5.1.3 Finnish legislation

The Finnish law does not directly say anything about how to handle credit card information. The Personal Data Act 1999 does cover the handling of some related information such as processing of personal identity number and credit data.

The personal identity number can used when deciding to grant credit or in debt collection (Personal Data Act 1999a). This data has to be handled so that it is not shown in printed documents or drawn from data files unless necessary (Personal Data Act 1999b). Personal credit data can only be accessed in case of credit granting and approval (Personal Data Act 1999c).

The handler of personal data must ensure that all technical and organisational measures are taken to protect the data. The data must be protected against theft, destruction and being made public. (Personal Data Act 1999d.)

If a person in the course of their duties gains access to any personal information they are not allowed to give this information out. The information in question may be about the nature, personal life or financial situation of another person. (Personal Data Act 1999e.)

6 Initial Proposal

This chapter will detail the initial proposal for a new credit card management system. It will include technical solutions, changes in operating procedures and changes to documentation such as rental agreements. The feedback received for the proposal will also be shown in this section.

6.1 Masking the credit card number

All the credit card information in the system will be shown using VPAN. This means only first six and last four digits of the credit card number are visible. To achieve this all incoming reservations with credit card data, deposits taken by the point-of-sale terminal and credit card information provided by the customer in the online service will be forwarded to a third party handler before they become visible in the rental system.

The third party will take the incoming information and mask all the credit card numbers and then forward the information to the rental system. This is done by calculating a token for the credit card number. This token will be then used take the deposits and make the charges on the credit card in question. The token will not be visible to the rental staff at any point. Only information they will see will be the VPAN, expiry date and deposit amount and deposit code.

This masking service is provided by many companies such as PayEx, Verifone and Nets.

6.2 Credit card management in rental transactions

When the rental car is picked up during the opening hours chip-and-pin is always used to take the deposit. Only in cases where the credit card provided by the customer does not include a chip or the customer does not know their pin will there be a possibility to bypass the chip-and-pin. In these cases the customer will always need to provide a valid identification and sign the deposit slip and the card still has to be read by a point-of-sale terminal. The credit card number can never be keyed in manually by the staff. The staff will always compare the credit card and driver's licence to see that the names on them match.

For rental starting outside the opening hours or deliveries the location will send the customer an email which will have a link to a secure service where the customer will have the ability to provide the Company with their credit card number. The customer will also have the ability to confirm his credit card details with their online banking credentials providing added security. This will also serve the Company as it can be sure that the information provided is really customer's own instead of stolen.

The email sent to the customer will include a reference agreed to beforehand with the customer so that the customer knows they can trust the email. The link in the email will only be valid for a short period of time, maximum 24 hours. This online service will be usable with any Internet-capable device from laptops to smart phones.

The possibility for the customer to go any Company location and have the deposit taken using either chip-and-pin or signing the deposit slip will be retained. This method will not be in active use but can be used as a backup for customer who do not trust their credit card details to online services.

This online service will also be used in the cases where the primary payer is the insurance company. This way the Company has the necessary credit card information to make charges if necessary at later stage.

In long term rentals lasting between two months and one year, the first deposit will need to be taken either with the point-of-sale terminal or the online service. After this the new deposits can be taken using the token received from the first deposit.

6.3 Credit card management in back-office routines

The back-office routines involving credit cards are invoicing, invoice correction, charging of damages and other miscellaneous charges such as service charge for providing municipal authorities or Finnish police with customer information for parking fines or traffic tickets. The handling of incoming reservations is also included in this section.

6.3.1 Invoicing

The invoicing system will create a file of all credit card charges that were on rental agreements finalized for invoicing the previous day. This file will have only the token, not the full credit card number. This file will only be available for personnel involved in invoicing.

The file will will be automatically sent via a secure transfer to the company that does the masking of credit card numbers. This company will then match the token, credit card number and deposit information and forward it to the company that processes all credit card charges.

The handling company, called an acquirer, will provide a report detailing all the successful charged made and all failed charges so that they may be investigated. This report will only show the status of the charge, amount, rental agreement number and the masked credit card number. This report will be provided in a format that can be secured with a password and/or is only available from a service that uses personal logins and passwords. This will ensure that access to the report can be monitored.

No report should be printed on paper unless absolutely necessary. All printed out reports should be taken to a locked storage for sensitive material after they are no longer useful. In case the report needs to be stored on a computer it has to be in a folder that is only accessible to personnel who have a legitimate work related need for it.

6.3.2 Invoice corrections

The invoice correction system will be connected to the rental system for credit card info. Using the token stored there a new deposit can be taken to be used in the correction.

After corrections are approved a file similar to the one from the rental system for credit card charges will be created by the invoicing system. This file will be automatically sent via secure transfer to the company that does the masking of credit card numbers. They will then forward all the information to the acquirer. The acquirer will provide similar report of successful and failed charges than for original credit card charges.

In a case where the correction results in a credit for the customer this credit will be applied by the system automatically after the correction has been approved. In the system for corrections will be a possibility to make a correction and stop the credit and/or new debit.

After the correction is approved and there is a new charge on customer’s credit card they will automatically be sent a receipt for the charge detailing the reason(s) for the charge, the amount and the card charged.

6.3.3 Incoming reservations

When the reservation is made on the Company’s online site or by the booking centre the reservation, and the possible credit card information on it, is stored in a central server. Every fifteen minutes all reservations for Finland are put in a single file and forwarded to the rental system. This will be changed so that the reservations file goes first to the company handling the masking of credit card numbers and after that these reservations are imported to the rental system.

When the customer comes to pick up their their reserved car their credit card will be checked to match the one on the reservation. Once the match has been confirmed a deposit is taken normally with the point-of-sale terminal.

6.3.4 Changes to rental agreement and other documents

In order for the Company to be able make after rental charges the rental agreement signed by the customer needs to be changed. A new segment will be added which details all the possible after rental charges and the credit card that will be used to make them. A separate signature from the customer indicating they have agreed to these possible charges will also be taken.

The new deposit slip will not show the full credit card number in either the rental company or the customer copy. Only the VPAN will be shown. The deposit slip will also have a segment clearly stating that the customer requested to bypass the chip-and-pin. There will also be a space for customer’s signature. The customer’s name in block letters will be shown under the signature the name being fetched from the rental system.

6.3.5 General process changes

All rental locations will have lockable cabinets to store open rental agreements. Any time rental staff is not working on an agreement, the agreement will be in the cabinet. The cabinet will always be locked while no personnel are present. At no point will rental agreements or any documentation related to it be unsupervised all around the counter.

The staff will not write down credit card details of the customer unless absolutely necessary. In a situation where any details were written down the rental staff must ensure the paper containing credit card information is always secured and disposed in a safe manner i.e. put into a locked container dedicated to sensitive material.

6.4 Feedback for Initial Proposal

Feedback for Initial Proposal was sought from Station Manager, Accounting Supervisor, and Customer Care Manager. Each was given time to read the proposal at their own leisure. Feedback was given in written form.

According to the feedback the Initial Proposal is sound and offers a good base to build the new system on. One feedback wanted to have more details in the description of the new operational processes. One feedback said that the new processes were cumbersome and would complicate the daily work of personnel. This means that in the Final Proposal these processes need to have more detailed descriptions and streamlining if possible.

One feedback also wanted a back-up system set up for situations where the primary system is not available. This back-up system will be detailed as part of the Final Proposal.

7 Final Proposal

This chapter will detail the Final proposal for a new credit card management system. It will include technical solutions, changes in operating procedures and changes to documentation such as rental agreements.

7.1 Masking the credit card number

All the credit card information in the system will be shown using VPAN. This means only first and last digits of the credit card number are visible. To achieve this all incoming reservations with credit card data, deposits taken by the point-of-sale terminal and credit card information provided by the customer in the online service will be forwarded to a third party handler before they become visible in the rental system.

The third party will take the incoming information and mask all the credit card numbers and then forward the information to the rental system. This is done by calculating a token for the credit card number. This token will be then used take the deposits and make the charges on the credit card in question. The token will not be visible to the rental staff at any point. Only information they will see will be the VPAN, expiry date and deposit amount and deposit code.

This masking service is provided by many companies such as PayEx, Verifone and Nets.

7.2 Credit card management in rental transactions

When the rental car is picked up during the opening hours chip-and-pin is always used to take the deposit. Only in cases where the credit card provided by the customer does not include a chip or the customer does not know their pin will there be a possibility to bypass the chip-and-pin. In these cases the customer will always need to provide a valid identification and sign the deposit slip and the card still has to be read by a point-of-sale terminal. The credit card number can never be keyed in manually by the staff. The staff will always compare the credit card and driver’s licence to see that the names on them match.

The functionality to determine the deposit amount will be incorporated into the rental software. This will take the form of a pop-up window where the rental staff inputs the wanted amount and then sends a signal to the point-of-sale terminal to be ready to accept the credit card. This pop-up window will also have the functionality to release the deposit on the card and also to clean all credit card information from the rental agreement.

The system will be made to handle all kinds of cards the same way. This will cut down the confusion regarding credit and debit cards. The customer will be able to choose which functionality of their card they want to use on the point-of-sale terminal and for the rental staff the procedure will always be same. The system will allow only deposits to be taken and no direct charges can be made.

In cases where the amount to be paid changes during the rental and is in the end higher than the deposit amount taken the system will take a new deposit for the difference. This way the rental staff does not need to release the old deposit and then take a new higher deposit.

For rental starting outside the opening hours or deliveries the location will send the customer an email which will have a link to a secure service where the customer will have the ability to provide the Company with their credit card number. The customer will also have the ability to confirm his credit card details with their online banking credentials providing added security. This will also serve the Company as it can be sure that the information provided is really customer’s own instead of stolen. Both Visa and MasterCard offer according to Evans & Schamalensee (2005, p. 305) password programs which could be used as an alternative to online bank confirmation, especially with foreign customers.

For this to work the location will have to check their reservations regularly so that they can contact the customer before delivery if the customer has not yet provided their credit card details. The rental system and reservations report will include a flag showing the credit card status of the reservation. This eliminates the need to open up each reservation individually to check the status.

The email sent to the customer will include a reference agreed to beforehand with the customer so that the customer knows they can trust the email. The link in the email will only be valid for a short period of time, maximum 24 hours. This online service will be usable with any Internet-capable device from laptops to smart phones.

This online service will also be used in the cases where the primary payer is the insurance company. This way the Company has the necessary credit card information to make charges if necessary at later stage.

The possibility for the customer to go any Company location and have the deposit taken using either chip-and-pin or signing the deposit slip will be retained. This method will not be in active use but can be used as a backup for customer who do not trust their credit card details to online services.

In long term rentals lasting between two months and one year, the first deposit will need to be taken either with the point-of-sale terminal or the online service. After this the new deposits can be taken using the token received from the first deposit.

The rental system will not allow the rental staff to manually key in the credit card details directly to the system. Information has to be read into the system either via point-of-sale terminal, the online service where customers provide the data securely and the back-up system.

7.3 Back-up system

A possibility to manually key in the credit card information will be retained as a back-up for primary system being unavailable. This back-up system should only be used as a last resort and also uses of it need to be reported to the Station Manager and the finance department.

When the primary functionality is not available the rental staff will utilize a form created and used for this purpose only. The form will include rental agreement number, customer information and credit card details. The form will also include a space for the customer to sign where they acknowledge that they gave out the information of their own free will. This form will be secured until such a time when the primary system is functional again.

The company masking the credit card details will have a portal where the credit card information can be keyed in from the form and then be sent back to the rental agreement masked with the token. After this the deposit can be taken normally. After this the form will be destroyed.

7.4 Credit card management in back-office routines

The back-office routines involving credit cards are invoicing, invoice correction, charging of damages and other miscellaneous charges such as service charge for providing municipal authorities or Finnish police with customer information for parking fines or traffic tickets. The handling of incoming reservations is also included in this section.

7.4.1 Invoicing

The invoicing system will create a file of all credit card charges that were on rental agreements finalized for invoicing the previous day. This file will have only the token, not the full credit card number. This file will only be available for personnel involved in invoicing.

The file will will be automatically sent via a secure transfer to the company that does the masking of credit card numbers. This company will then match the token, credit card number and deposit information and forward it to the company that processes all credit card charges.

The handling company, called an acquirer, will provide a report detailing all the successful charged made and all failed charges so that they may be investigated. This report will only show the status of the charge, amount, rental agreement number and the masked credit card number. This report will be provided in a format that can be secured with a password and/or is only available from a service that uses personal logins and passwords. This will ensure that access to the report can be monitored.

No report should be printed on paper unless absolutely necessary. All printed out reports should be taken to a locked storage for sensitive material after they are no longer useful. In case the report needs to be stored on a computer it has to be in a folder that is only accessible to personnel who have a legitimate work related need for it.

7.4.2 Invoice corrections

The invoice correction system will be connected to the rental system for credit card info. Using the token stored there a new deposit can be taken to be used in the correction. This functionality will be similar to the pop-up window in the rental system. In other respects the procedure for corrections will remain in its current form.

After corrections are approved by the finance department a file similar to the one from the rental system for credit card charges will be created by the invoicing system. This file will be automatically sent via secure transfer to the company that does the masking of credit card numbers. They will then forward all the information to the acquirer. The acquirer will provide similar report of successful and failed charges than for original credit card charges.

In a case where the correction results in a credit for the customer this credit will be applied by the system automatically after the correction has been approved. There will be no need to transfer the complaint to a general finance user with the full credit card infromation visible. In the system for corrections will be a possibility to make a correction and stop the credit and/or new debit in case the correction is needed only to balance the accounts receivable.

After the correction is approved and there is a new charge on customer’s credit card they will automatically be sent a receipt for the charge detailing the reason(s) for the charge, the amount and the card charged.

7.4.3 Incoming reservations

When the reservation is made on the Company’s online site or by the booking centre the reservation, and the possible credit card information on it, is stored in a central server. Every fifteen minutes all reservations for Finland are put in a single file and forwarded to the rental system. This will be changed so that the reservations file goes first to the company handling the masking of credit card numbers and after that these reservations are imported to the rental system.

When the customer comes to pick up their their reserved car their credit card will be checked to match the one on the reservation. Once the match has been confirmed a deposit is taken normally with the point-of-sale terminal. In the case of customers enrolled in the loyalty program where their rental agreements need to prepared two hours in advance of the pick-up the function to remotely take the deposit will be used.

7.4.4 Changes to rental agreement and other documents

In order for the Company to be able make after rental charges the rental agreement signed by the customer needs to be changed. A new segment will be added which details all the possible after rental charges and the credit card that will be used to make them. A separate signature from the customer indicating they have agreed to these possible charges will also be taken.

The new deposit slip will not show the full credit card number in either the rental company or the customer copy. Only the VPAN will be shown. The deposit slip will also have a segment clearly stating that the customer requested to bypass the chip-and-pin. There will also be a space for customer's signature. The customer's name in block letters will be shown under the signature the name being fetched from the rental system.

7.4.4 General process changes

All rental locations will have lockable cabinets to store open rental agreements. Any time rental staff is not working on an agreement, the agreement will be in the cabinet. The cabinet will always be locked while no personnel are present. At no point will rental agreements or any documentation related to it be unsupervised all around the counter.

The staff will not write down credit card details of the customer unless absolutely necessary. In a situation where any details were written down the rental staff must ensure the paper containing credit card information is always secured and disposed in a safe manner i.e. put into a locked container dedicated to sensitive material.

8 Discussion and Conclusion

8.1 Summary

The credit card data management practices at The Company were not compliant with the standards and regulations issued by the payment card industry. This is shown for example in the staff keying in the credit card information manually, having the full credit card number visible in the rental system and transferring the information via unsecured connection. Due the non-compliance of the credit card data management practices the Company runs the risk of customer complaints and having no standing to dispute those complaints risks losing revenue.

To address these issues a current state analysis was performed based on interviews with employees who handle credit cards or credit card information in their daily work. These employees represent the whole data flow from incoming reservation through the pickup of rental car to the final invoicing and possible corrections. The results of the current state analysis were then combined with best practices gained from Payment Card Industry Security Standards Council and Nets Oy to produce a plan for new and comprehensive credit card data management system. The plan addressed all identified issues of non-compliance and contained changes to processes, systems used and documents.

8.2 Managerial Recommendations

The plan proposed in this thesis should be implemented in whole and not choose bits and pieces of it. This will make sure that all the changes and new systems and processes fit together. It will also mean that all the issues in the current system will be taken care of.

A dedicated Project Manager should be named and they in turn should gather around them a Project Team. The Project Team should include personnel who handle credit cards or credit card data in their daily work, i.e. those interviewed for this thesis.

8.3 Evaluation of the Thesis

8.3.1 Outcome vs Objective

The objective of this thesis was to identify all instances of non-compliance and to create solutions for these instances. The final outcome would then be a proposal for a new credit card data management system which addresses all of these instances.

The objective of this thesis was met. All the issues were identified and addressed in the plan. According to the feedback received the proposed plan is sound and offers a good base to build the new system on.

8.3.2 Reflection & Afterword

All in all the thesis process went smoothly. The choice of topic was easy as there had already been discussions in the Company of the need to develop a new credit card management system. There were no problems in setting up the interviews for the current state analysis and the interviews provided enough data to conduct the analysis on a sufficient level. The best practice was also readily available as rules for credit card data management are standardized.

The most difficult part was devising solutions to the identified issues and coming up with processes that would both satisfy the rules and regulations and be as easy as possible for the staff to follow. In the end the proposal succeeds in this. Of course the final test is when the new processes are put in use.

The proposals could have been more in-depth. Instead of just stating what the new process is they could also have said how it should be done. On the other hand these issues can and should be resolved when the proposal is implemented. The implementation of the proposal was purposely left out of this thesis as it was felt to be a subject worthy of its own thesis.

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Station Manager. (2016) Interviewed by Olli Nurmi

Interview questions

1. What is your role in the Company?
2. What are your duties?
3. Describe in detail how you handle credit cards/credit card information in your daily work
4. What would you keep of the current credit card management system?
5. What would you change in the current credit card management system?

List of figures and tables